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ABSTRACT

Most of the 101 citations included in this annotated bibliography on simulation and gaming were derived from a search of the Educational Resources Information Center (ERIC) indexes. Entries were published between 1972 and 1975. The bibliography is divided into nine sections: theory and research; social studies materials; environment, land use, and planning; language, communication, and reading; business and economics; political science and law; vocational education; science and mathematics; and miscellaneous. Included is an introduction giving a philosophy of simulation/gaming and listing scurces of further information. (CH/PF)

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Simulation and Gaming: The Best of ERIC

Don H. Coombs

August 1976

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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EDITOR'S NOTES

Nearly all the citations in the bibliography were compiled from the indexes of the Educational Resources Information Center (ERIC). Although this is the first "Best of ERIC" annotated bibliography in the subject area of simulation and gaming, it follows in the tradition of a number of other "Best of ERIC" publications, including two current titles: *Computer Assisted Instruction: The Best of ERIC, 1973-May 1976* and *Instructional Television: The Best of ERIC 1974-1975*.

A few journal articles remain unannotated in this paper in cases where reviewers felt article titles were self-explanatory.

* * *

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For information about ERIC, and for information on other titles in the fields of libraries, information science, and educational media and technology, write: ERIC Clearinghouse on Information Resources, Stanford Center for Research and Development in Teaching, Stanford University, Stanford, California 94305.

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The material in this publication was prepared pursuant to a contract with the National Institute of Education, United States Department of Health, Education and Welfare. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgement in professional and technical matters. Prior to publication, this manuscript was submitted to the president of the North American Simulation and Gaming Association for critical review and determination of professional competence. This publication has met such standards. Points of view or opinions, however, do not necessarily represent the official view or opinion of either the reviewer or the National Institute of Education. Contract No. NIE-C-74-0027.

INTRODUCTION

This "Best of ERIC bibliography joins others issued by the ERIC Clearinghouse on Information Resources at Stanford University in recent years, and has the same goal: To give the reader an idea of where things stand in a particular area and to identify selected documents recently published in that area.

Problems and Payoffs in Simulation/Gaming

Simulation/gaming is unusual in several respects. For one thing, it pertains to a process, a method, rather than to a subject matter area. There is a good side to this, because it means that a successful application in a specific situation often can be adapted to serve in other situations. Some of the documents presented in this bibliography were selected with such a dual role in mind.

To date, simulation/gaming as a learning technique has suffered from a number of handicaps. It has from the beginning affronted some conservative educational administrators as being too much a matter of "fooling around." The Protestant Ethic may be at the heart of this, but there also is a strong conservative element in American education which does not take lightly to change.

Simulation/gaming, used successfully, can seem very different indeed from traditional methods. To individuals considering whether to employ a simulation game, there is some implicit threat, for they will be entering into an interactive learning situation rather than sitting at a desk dispensing wisdom. Yet a growing number of teachers and individuals involved in industrial, military, and other forms of training have come to feel that the results are well worth the effort and the risk to one's psyche.

Another problem in simulation/gaming results from the discovery by professional educators of the scientific method. The natural tendency is to require hard experimental data and hypothesis-testing from graduate students when the time to write the dissertation rolls around. Many of these scientific studies of specific simulation/games are competently designed and executed. To risk overgeneralization, most studies show that individuals learn factual information from simulation/gaming experiences about as well as from traditional classroom instruction.

But conveying factual information is not what simulation/gaming is all about. Involving learners in complex situations and giving them experience

interacting with certain environments and people is a far better reason for employing simulation games. As educational philosophers have pointed out, young people used to grow up in "experience-rich, information-poor" environments. With today's flood of media, exactly the opposite is the case, and simulation/gaming offers one way to compensate, one way to provide young people with relevant experience. The question does not have to be whether simulated experience is better than "real" experience. Given the constraints often placed on education and training these days, the question often is whether simulation is better than no experience.

One area where simulation certainly is better than no experience is in dealing with attitudes--understanding how they are formed, communicated, and changed. The whole area of "affect" has been receiving increasing attention recently, and simulation/gaming can be an effective approach.

If there is a major problem in simulation/gaming today, it is in evaluation. Before investing time and money in simulation/gaming, the wise person wants information on probable results. A number of approaches to evaluation have been proposed, some of them quite promising, and knowledgeable advice is available from a number of individuals and projects across the country.

But the reasonable desire for rational evaluation can be carried too far. For the past ten years numerous studies have sought to nail down the precise effect of using certain simulation/games with certain students in a certain environment. Criticism of these studies, in some cases, has come down to the obvious: They do not demonstrate the result of using the game with all possible students in all possible situations.

This is true, of course. But we got off the track years ago, when the idea of such exhaustive evaluation of individual simulation/games somehow seemed feasible. Demanding such detailed evaluation of every simulation/game is basically in error. Simulation/gaming is a process, or a medium, and to demand evaluation of a simulation in all possible situations makes as much sense as expecting to have every book evaluated in a similar fashion. To carry this analogy a bit further, there are bad books and good books, but the basic format--printing on pages that are bound together--is accepted as viable and worth considerable investment by our schools. And it is common to accept evaluation of books by an experienced critic. Certainly there has been rigorous evaluation of some textbook series, but in many cases we judge books for ourselves or depend on the opinion of a trusted expert. That is the

arrangement we will settle for, of necessity, in simulation/gaming.

If there are problems in adopting simulation/gaming, there also are payoffs. Simulation/gaming can make learning exciting. A bad simulation/game, of course, is just bad. But a good one, directed by someone willing to prepare himself or herself and willing to invest further effort in adequate debriefing, can be the highpoint of a student's career as an "educational consumer."

If there were no other reason to consider using simulation/games, they would be attractive devices because they allow participants to try different approaches in complex situations that are only one step removed from real life. Society can be very unforgiving, sometimes. With simulation/gaming, situations that are both physically and psychologically dangerous can be experienced in a safe environment.

Information Sources

There is a strong temptation, given the chance to write the introduction to a bibliography like this, to tell everything one knows. Now that I have done that, in the philosophical sphere, I would like to conclude with a few notes on sources of information which, for one reason or another, are not included in the bibliography proper.

A national professional organization devoted to using simulation/gaming in learning situations--the North American Simulation and Gaming Association (NASAGA)--is the recently-incorporated version of the former National Gaming Council. Information on joining the other members--who include elementary teachers, college teachers, and game designers--is available from NASAGA, c/o COMEX Project, University of Southern California, 3601 South Flower Street, Los Angeles, California 90007.

Two national publications are dedicated to simulation/gaming. The traditional academic journal is *Simulation & Games, An International Journal of Theory, Design and Research*, available four times a year from Sage Publications, 275 South Beverly Drive, Beverly Hills, California 90212 for $12 a year to individuals.

Simulation/Gaming started out as *Simulation/Gaming/News*, but always has included both research summaries and actual examples of simulation/games. It is available (six issues a year) for $6 from S/G, Box 3039, University Station, Moscow, Idaho 83843.

One book out recently that looks at simulation/gaming and does a good job

both of generalizing and of pointing on to more specific information is *Gaming-Simulation: Rationale, Design and Applications* by Cathy S. Greenblat and Richard Duke. Something of an anthology, it includes chapters by such leaders as R. Garry Shirts, Allen Feldt, Richard L. Meier, and Fred Goodman. It was published in 1975 by Halsted Press, a division of John Wiley & Sons, for $17.50.

Directories listing available simulation/games are vital if the use of simulation/games is to continue to increase. At the moment, a good one exists in the "social education" area, and another is promised which will cover that and other areas.

The Handbook of Simulation Gaming in Social Education (Part 2: Directory) by Ron Stadsklev is available from the Institute of Higher Education Research and Services, Box 6293, University, Alabama 35486 for $12.

The promised directory is the third edition of *The Guide to Simulations/Games for Education and Training*, edited by Robert E. Horn. It is to be available from Didactic Systems, 6 North Union Avenue, Cranford, New Jersey 07016, at a price to be announced. The second edition (1973) of Horn's guide was still in print in 1976, but is beginning to be very dated.

Scope of this Bibliography

Definitions have never seemed an exciting way to begin a discussion of anything, but it probably would be desirable to outline here what was considered to be within the scope of this bibliography. For our purposes, a simplified version of a real life situation is a simulation. Add an element of competition and it is a simulation/game. There is a tendency in directories to lump all the logical varieties together, and this bibliography contains items that describe pure simulations, simulation/games, and pure games. All have some relevance to experiential learning situations, but I have excluded such areas as the simulation of hardware systems (to determine if they are strong enough to function after impacting on Mars, for example) and the form of simulation known as model building, where the process is really research (simulating traffic flow at a freeway interchange, for example).

In addition to documenting successful practice, this bibliography identifies some recent surveys that suggest prospects of simulation/gaming. The bibliography is definitely not exhaustive, but it does point to sources of information which in turn point to just about everything important going on in simulation/gaming.

THEORY, RESEARCH, AND GENERAL

Allen, Layman E. "Queries 'n Theories: An Instructional Game on The Dot, Dot, Dot,...An Approach to Scientific Method." *Instructional Science*, 3 (October, 1974), 205-230.

"Queries 'n Theories" provides a parallel to the strong inference approach to the scientific method--designing experiments, observing data, and theorizing.

Braun, Ludwig. *Learning through Computer Simulations.* Paper presented at the Annual Meeting of the American Educational Research Association, Washington, D.C., March 30-April 3, 1975. 15pp. ED 104 376.

Prior to the relatively easy access to computers which began in the mid-1960s, simulation was a tool only of researchers. Computer simulation now can provide a powerful teaching tool for individuals, for small and large groups, for laboratory experiments, for independent enrichment activity, or for classroom use. As computers become easier for teachers to acquire and use, the potential of computer simulation can be realized. A number of computer simulations and their various applications are presented.

Chapman, Katherine, and Jack E. Cousins. *Simulation/Games in Social Studies: A Report. SSEC Publication No. 164.* Boulder, Colorado: ERIC Clearinghouse for Social Studies/Social Science Education and Social Science Education Consortium, Inc., 1974. 95pp. Available from Social Science Education Consortium, 855 Broadway, Boulder, Colorado 80302 ($4.25). ED 102 036.

This National Institute of Education-sponsored report presents descriptive and analytical information on the use of simulation/games in elementary and secondary social studies classrooms from a survey of some 133 teachers. Among the findings were: (1) journal articles and books are the major source of information about simulation/games; (2) games are an effective way to reach nonverbal students and underachievers, and to get greater student involvement; and (3) the most frequently-used evaluation methods are observational.

Chartier, Myron Raymond. *Toward a Theoretical Model of Learning As It Relates To Simulation Games With Discussion.* 1974. 15pp. ED 088 417.

In order for research on the educational utility of simulation/games to advance, a set of significant variables must be stipulated. This process, in turn, requires the building of testable theoretical models and the formulation of strategic propositions to test their validity.

Coombs, Don H. "Games? They're a Serious Approach to Learning. Educational Technology Revisited: Profile 11." *Planning for Higher Education*, 4 (October, 1975), 23-28.

Looking at the present state of simulation/gaming in higher education, this article includes two successful examples of using simulation/games and some "street corner" suggestions on how to introduce them into an institution.

Coombs, Don H. "More on Simulation Gaming. Educational Technology Revisited: Profile 14." *Planning for Higher Education*, 4 (December, 1975).

The way an entire course can be shaped around a single game is described in this article. Projects established to promote and support gaming, and sources for more information on the subject, also are presented.

Edwards, Stephen D. *The Use of Descriptive Studies in Simulation Game Research.* Paper presented at the Annual Meeting of the National Council for the Social Studies, Atlanta, Georgia, November 26-29, 1975. 9pp. ED 115 567.

Descriptive research studies--case studies of persons who have field tested, observed, or participated in a simulation/game exercise--can make important contributions to the development of simulation/game research by identifying user problems, devising new evaluation methods, helping to clarify requisite skills, and raising questions about the sequencing of activities within courses.

Frank, Frederick P. *The Changing Role Behaviors of Educational Administrators During Role Simulation Training: Perceptions of Verbal and Non-Verbal Interaction.* Paper presented at the Annual Meeting of the Conference on Culture and Communication, Philadelphia, Pennsylvania, March 1975. 29pp. ED 108 270.

The focus of this study is the verbal, nonverbal, and proxemic aspects of dyadic interaction (communication involving only two people) and their meanings. Among the conclusions were: (1) that a research methodology can be devised using self-observation procedures combined with structured non-participant observer techniques, and (2) that videotape simulation and structured interviews help researchers perceive the meanings of human behaviors, including role shifts and verbal and body language changes during role-simulation episodes.

Heitzman, William R., and Charles Staropoli. "Attitudinal Change in Social Studies Simulations: The Research Findings." *California Council for the Social Studies Review*, 14 (Winter, 1974), 4-5.

The majority of studies in attitudinal change reviewed in this article show that simulations do affect attitudes.

Heyman, Mark. "Using a Big Game, CLUG, to Drive an Entire Course Demands Commitment." *Simulation/Gaming/News*, September, 1974, pp. 32-35.

A teacher discusses his experience using the Community Land Use Game (CLUG) as the core of an undergraduate/graduate course called "The City." He evaluates the outcomes of the course and makes recommendations for the successful use of "big games" in the classroom.

Loadman, William, and Ann Ruedele. *Simulation: An Alternative in Teaching Educational Research.* Paper presented at the Annual Meeting of the American Educational Research Association, Washington, D.C., March 30-April 3, 1975. 18pp. ED 105 901.

Researchers investigated the effectiveness of a computer simulation model as an alternative means of teaching research methodology. The simulation was designed to teach skills and concepts in problem definition, hypothesis generation, sampling, research design, data analysis, interpretation and reporting, and the application of those skills and concepts via the simulation problem. Results indicate that: (1) the simulation approach was very successful both in terms of attitudes and skill levels in research methodology, and (2) students in the experimental groups gained additional skills when compared to those in the traditional sections. However, the lack of a closely controlled experimental environment suggests further investigation.

Lucas, Lawrence A., and others. *A Comparative Study of Cognitive Retention Using Simulation-Gaming as Opposed to Lecture-Discussion Techniques.* Muncie, Indiana: Ball State University, April 1974. Paper presented at the American Educational Research Association Annual Meeting, Chicago, Illinois, April 15-19, 1974. 12pp. ED 089 690.

A study of the effect of simulation/gaming techniques upon the acquisition and cognitive retention of facts, concepts, and principles found that students in the experimental group performed significantly better on a delayed interval posttest measure of cognitive retention. It was concluded that the simulation/gaming techniques represent a pedagogical tool that significantly enhances learning.

Metzner, Seymour. "Simulation Gaming: Problems and Proposals." *California Council for the Social Studies Review*, 14 (Winter, 1974), 4-5.

The author discusses criticisms of simulation procedures, and suggests ways to improve them.

Miller, Gary G. *Some Considerations in the Design and Utilization of Simulators for Technical Training.* Brooks Air Force Base, Texas: Air Force Human Resources Laboratory, August 1974. 31pp. ED 097 919.

The current technical literature on simulators, training devices, and simulation in technical training is reviewed in this paper, which also includes rules and principles for the cost-effective application of simulation. A major finding was that fidelity can be quite low in certain procedural tasks without resulting in a decrement in performance. Other studies indicate that some complex electronic equipment can be simulated in simple, relatively inexpensive devices without having an adverse effect on training.

Piel, E.J. "Evaluation of Huntington II Project on Computer Simulation." *Journal of Educational Technology Systems*, 3 (Spring, 1975), 303-312.

The findings of an evaluation of the use of computer simulation packages in secondary schools are discussed in this article.

Plummer, Charles M. *Social Influence Through Simulation: Changing Attitudes with the "School Game."* Paper presented at the American Educational Research Association Annual Meeting, Chicago, Illinois, April 15-19, 1974. 33pp. ED 090 926.

Researchers investigated the effect of participation by college students in the "School Game" upon changes in their attitudes toward educational games. The simulation/game used was based on Kelman's theory of social influence and attitude change, in which three processes--compliance, identification, and internalization--produce attitude change. College students' attitudes after playing the "School Game" became significantly more positive toward statements asserting that: (1) Games promote positive affect; (2) The class meeting was an exciting instructional session; and (3) Teachers should use learning games. Their attitude toward a fourth statement that games promote learning was neutral.

Postma, Charles H., and others. *Student and Teacher Affective Perception of Simulation-Gaming as a Pedagogical Technique.* Muncie, Indiana: Ball State University, April 1974. Paper presented at the American Educational Research Association Annual Meeting, April 15-19, 1974. 8pp. ED 090 936.

A research project comparing experimental (simulation techniques) and control (traditional instruction) groups in a five-week U.S. history unit found that the experimental group experienced growth in positive attitudes toward schooling, evidenced by marked increases in classroom participation, interest, conceptualization, enjoyment of class, and cooperative learning with peers. A return to

traditional instruction revealed marked decreases in these variables over time.

Weiting, Stephen G. "Simulated Research Experiences for Use in Teaching Research Methods." *Teaching Sociology*, 3 (October, 1975), 33-59.
The development and implementation of simulated research experiences for use in teaching research methods to undergraduate sociology majors are described.

SOCIAL STUDIES

Alker, Hayward R., Jr. "Computer Simulations: Inelegant Mathematics and Worse Social Science?" *International Journal of Mathematical Education in Science and Technology*, 5 (April-June 1974), 139-155.
Achievements, limitations, and difficulties of social science simulation efforts are discussed, with particular reference to three examples. The pedagogical use of complementary developmental, philosophical, mathematical, and scientific approaches is advocated to minimize potential abuses of social simulation research.

Chapman, Katherine, and others. *Simulation/Games in Social Studies: What Do We Know?* Boulder, Colorado: ERIC Clearinghouse for Social Studies/Social Science Education, and Social Science Education Consortium, Inc., 1974. 66pp. Available from Social Science Education Consortium, Inc., 855 Broadway, Boulder, Colorado 80302 (SSEC No. 162; $2.85). ED 093 736.
This state-of-the-art paper provides teachers and other educational decision-makers with analytical and critical information about the use of simulation/games in social studies classrooms. Non-computer, commercially-available simulations and simulation/games intended for use at grades 5 through 12 are included, as well as: (1) an intensive review of the theoretical and research literature on gaming and simulation; (2) an analysis of patterns of integration of simulation/games within several social studies projects; (3) a critical evaluation of many freestanding simulation/games; and (4) an analytical framework for examining various simulation-type activities.

Data-Bank Resource Packets. Sturbridge, Massachusetts: Old Sturbridge Village, Museum Education Department, November 1974. 462pp. Available from Old Sturbridge Village, Museum Gift Shop, Sturbridge, Massachusetts 01566.
Primary sources such as diaries and census data from early nineteenth-century Sturbridge Village, Massachusetts are the basis for this set of resource packets. These supplementary packets, adaptable to various grade levels, help students explore questions about the pace of work in a rural society, the role of individuals in a farm family, community government, and many other topics.

Fleming, Dan B. "Help: Where and for Whom?" *Intercom*, October, 1975, pp. 11-12.
A simulation designed to examine American responsibility with respect to global hunger is presented. Students play American leaders who must choose between conflicting national and international priorities.

Hatcher, William D., and Carol V. Hatcher. "Simulations Do Fit Your Curriculum: A Working Model." *California Council for the Social Studies Review*, 14 (Winter, 1974), 16-17.
A model for designing classroom simulations is proposed as a way to integrate values and social studies in the classroom.

Joels, Kerry Mark. "Aerospace Education--1990." *Journal of Aerospace Education*, 2 (March, 1975), 4-5.
Simulation/games and scenarios are among the activities that can be used in the classroom for "futuring." Such educational applications of the future can help students achieve more effective understanding.

Keller, Clair W. "Role Playing and Simulation in History Classes." *History Teacher*, 8 (August, 1975), 573-581.
Suggestions and examples for using role-playing and simulation in college history classes that are easily adaptable to elementary and secondary education are presented.

Sigelman, Lee. "Welfare on $1.50 a Day: Field Work as a Teaching Tool." *Social Studies*, 65 (November, 1974), 254-256.
The author discusses some disadvantages to simulation and gaming techniques. Instead, he advocates and examines the educational advantages of student participation in real world field research. Ideas for student field research are suggested.

Targ, Harry R. "Elementary School Inter-Nation Simulation: Impacts on Developing Orientations to International Politics." *Teaching Political Science*, 2 (April, 1975), 300-320.
The initial evaluation of an elementary school international relations simulation indicates that the simulation had the most impact on participant beliefs.

ENVIRONMENT, LAND USE, AND PLANNING

Barkley, William D., and Gary Dickinson. "The Design and Evaluation of a Rural Land Use Planning Simulation Game." *Adult Education*, 24 (Summer, 1974), 280-292.
Forty rural adults in British Columbia participated in a simulation/game using land capability data to teach certain principles and competencies required for effective land use planning.

Eckman, Tom, comp. *Environmental Games and Simulations*. 1974. 9pp. ED 091 161.
This publication consists of a list of 35 environmental games on the market today, their sources and purchase prices. Included is a description of the major changes the types of games have undergone, from ordinary board games with success dependent on skill and/or chance rather than understanding of the subject matter, to simulations that attempt to replicate a simplified reality.

Eisemon, Thomas. "Simulations and Requirements for Citizen Participation in Public Housing. The Truax Technique." *Environment and Behavior*, 7 (March, 1975), 99-123.

This paper considers the use of simulation to evoke citizen involvement in the design of low-cost public housing. Using this technique, citizens are able to express their preferences visually. The purposes, features, and outputs of this simulation are described, and the technique is compared with alternative strategies.

Hackett, Jay K. "Getting It Together: An Environmental Simulation Problem." *Science Teacher*, 42 (February, 1975), 47-50.

Two simulation exercises conducted at an outdoor camp in Colorado involved the physical, social, political, and environmental factors associated with a nuclear generating plant and the construction of an airport in the Rocky Mountain National Park.

METRO-APEX Volume 1.1: Game Overall Director's Manual. Revised. Los Angeles: University of Southern California, COMEX Research Project, 1974. 187pp. Available from COMEX Project, The John and Alice Tyler Building, 3601 South Flower Street, Los Angeles, California 90007. ED 104 697.

The *Game Overall Director's Manual* is one of a set of 21 manuals used in "METRO-APEX 1974," a computerized college and professional level, computer-supported, role-play simulation exercise of a community with "normal" problems. Stress is placed on environmental quality considerations. The METRO-APEX computer program is in Fortran IV and runs on an IBM 360-50 or higher series computer. The other 20 manuals also are included in the ERIC system (ED 104 698-ED 404 717; see the August 1975 issue of *Resources in Education*).

Oakley, Deborah. *Population Stabilization in the United States: A Teaching Case Study.* 1975. 18pp. ED 111 716.

In a simulation of a Congressional hearing on national population policy, university students and community members decide a resolution introduced in the U.S. Senate in 1971 proposing the stabilization of population growth. Background information on U.S. population growth and projected future population increases are provided in the unit. Three evaluation methods, a list of possible associated activities, and a bibliography also are included.

Papps, Grayce, and others. *A Blueprint For a Television Environmental Simulation Project: "The Land and Me."* Orono: Maine Public Broadcasting Network, 1974. 84pp. *Game only* available from: ECO-ACRES Game, Maine Public Broadcasting Network, University of Maine, Alumni Hall, Orono, Maine 04473 (free). ED 088 494.

An experimental project sought to build a replicable model of a viewer-active television simulation. Other educational goals were to: (1) increase citizen concern for environmental factors and land use; (2) disseminate information on land use agencies; (3) illuminate the citizen's role in public planning; and (4) develop new patterns of problem-solving. Post-program survey results indicate that viewers of the simulation programs: (1) became better informed about land use issues; (2) developed an appreciation for the complexity of environmental problems; (3) began to debate more actively about land use; and (4) had positive feelings about the worth of the simulation.

Pidot, George B., Jr. *ACRES: Area Community Real Estate Simulation. (An Environment and Development Game).* Hanover, New Hampshire: Dartmouth College, N.H. Kiewit Computation Center, 1973. 101pp. Available from Project COMPUTe, Kiewit Computation Center, Dartmouth College, Hanover, New Hampshire 03755 ($4.00; check payable to "Dartmouth College-Project COMPUTe).

This simulation/game is designed to give undergraduate students an improved understanding of the dynamics of urban development. The game stresses interaction with other players rather than winning or losing. A scenario for the role-playing, computer programming directions, and sample computer printouts and worksheets are included.

Rabiega, William A. *Transfer: An Intraurban Residential Migration Game.* n.d. 46pp. ED 090 121.

Materials for an intraurban residential migration classroom game and appended game materials are designed for use as an introduction to an urban geography course or an illustration of social processes and methods in a behavioral geography course. The introduction explains the game organization and play, details the concepts it is designed to illustrate, and outlines the possible directions of classroom discussion.

Walters, Anthony S. "ARPEGE: A Realistic Tool for Environmental Education." *Engineering Education*, 65 (April, 1975), 739-743, 766.

The "Air Pollution Episode Game" (ARPEGE) is designed to address the problem of dealing with acute episodes that may extend over several days. An overview and details of staging the game are included.

LANGUAGE, COMMUNICATION, AND READING

Campbell, Patricia. *A Personalized, Non-Textbook-Oriented Approach to Learning German at Rose Hill Junior High School.* August 1974. 25pp. ED 100 165.

The German language instruction program at Rose Hill Junior High School in Redmond, Washington provides for individualized instruction, and no major emphasis is put on any basic textbook. The program's development is summarized, followed by a detailed discussion of its implementation.

Cheathan, T. Richard, and Keith V. Erickson. *Simulation Learning Experiences in Speech Communication.* Paper presented at the Annual Meeting of the International Communication Association Convention, Chicago, Illinois, April 1975. 24pp. ED 113 768.

Reseachers surveyed members of the Speech Communication Association to determine the status, rationale, and effectiveness of simulation and game exercises within the discipline. Responses indicate that the utilization of communication games is a popular teaching strategy, with more than 70 percent of the respondents noting utilization of the games.

A Collection of Games and Activities for the Instruction of Pre-Reading Skills. Springfield: Illinois State Office of the Superintendent of Public Instruction, 1974. 16pp. ED 106 780.

In this collection games and activities are listed for each of the following areas of pre-reading skills: Language development, articulation improvement, auditory discrimination, visual discrimination, and visual motor skills. A discussion of each activity and directions for implementation also are provided.

DeVries, David L., and Ida T. Mescon. *Teams-Games-Tournament: An Effective Task and Reward Structure in the Elementary Grades. Center for Social Organization of Schools, Report Number 189.* Baltimore, Maryland: Johns Hopkins University, Center for the Study of Social Organization of Schools, January 1975. 39pp. ED 110 880.

This National Institute of Education-sponsored study tested TGT (Teams-Games-Tournament), an instructional technique employing team competition, in a six-week third grade basic language arts skills course. Post-treatment results indicate significant TGT effects on both the Hoyum-Sanders Elementary English Test and a treatment-specific test of language arts skills. TGT also appeared to increase cohesion among the students and to decrease the number of social isolates in the classroom. The results provide additional evidence of the usefulness of incorporating TGT into the classroom, even with young children.

Harpole, Charles. "ERIC Report: Gaming and Simulation in Speech Communication Education." *Speech Teacher*, 24 (January, 1975), 59-64.

This article describes materials found in the ERIC system, as well as other resources on simulation/gaming in speech communication education.

Mullen, T. Patrick. *Simulation, Role Playing, and Games in Pre-service and In-Service Education.* Paper presented at the Plains Regional Conference of the International Reading Association, St. Louis, Missouri, February 20-22, 1975. 10pp. ED 103 806.

Role-playing and simulation are employed in the training of pre-service teachers to acquaint them with the problems of the poor reader. Techniques and teaching procedures discussed include using cryptograms to illustrate the difficulties the poor learner may experience in learning to read, using auditory distractions on a taped lecture followed by a quiz, following directions on a standardized reading test, teaching mini-lessons to classmates, taking a standardized reading test, assuming the role of a teacher faced with a specific problem, and playing games developed for teaching specific reading skills to children. Research aimed at determining the most effective means of teaching pre-service teachers the phonic principles also is discussed.

Ruben, Brent D., and Richard W. Budd. *Human Communication Handbook: Simulations and Games.* 1975. 174pp. Available from Hayden Book Company, Inc., 50 Essex Street, Rochelle Park, New Jersey 07662 (paper, $6.95).

This book provides a basic interdisciplinary framework for thinking about human communication, and contains a collection of carefully-selected and ordered experience-based learning activities designed to clarify the communication process. Chapters cover aspects of communication in a number of disciplines, including anthropology, art, economics, linguistics, psychology, history, journalism, zoology, and education. Works of scholars from these diverse fields are incorporated in an effort to arrive at a broader definition of the concept of communication, to sketch the dimensions of the range for study, and to discuss the problems and potential for future progress.

Saunders, Helen V., comp. *Fun and Games with Foreign Languages.* Charleston: West Virginia State Department of Education, 1974. 28pp. ED 096 857.
Some 11 West Virginia teachers contributed the games included in this publication. All have been classroom-tested for their educational results, as well as for their promotion of student interest, and are intended for use in foreign language classes.

Saur, William. "Family Communication Game." *Family Coordinator*, 24 (April 1975), 227-229.
The "Family Communication Game" provides a simple, flexible structure for an active experience in family communication behavior.

Troyka, Lynn Quitman. *A Study of the Effect of Simulation-Gaming on Expository Prose Competence of College Remedial English Composition Students.* Doctoral dissertation. New York University, New York, New York, 1973. 270pp. Available from University Microfilms, 300 N. Zeeb Road, Ann Arbor, Michigan 48106 (No. 73-30,136; microfiche $7.50, photocopy $15.00).
The purpose of this investigation was to measure the effect of simulation/gaming on the expository prose competence of community college remedial English composition students. The major findings show that: (1) the experimental group achieved significantly higher scores on all measures than did the control group; and (2) the size of the effect of the independent variable on the dependent variable ranged from very large to medium, supporting the contention that simulation/gaming had a positive effect on the expository prose of these students.

Turney, Michael L. *Mass Communication Games: Simulation-Games for Teaching/Learning About Journalism/Mass Communication.* Doctoral dissertation. The University of Iowa, Iowa City, Iowa, 1973. 321pp. Available from University Microfilms, 300 N. Zeeb Road, Ann Arbor, Michigan 48106 (No. 74-16,692; microfiche $7.50, photocopy $15.00).
This dissertation explores teaching/learning applications of simulation/gaming to journalism/mass communication education. It proposes eight uses for simulation/games and develops a series of generating principles appropriate for designing broad system-oriented simulation/games. Three specific simulation/games designed and conducted using these generating principles also are discussed to demonstrate their application.

BUSINESS AND ECONOMICS

Hoyle, Joe. "The Audit Simulation." *Journal of Business Education*, 50 (March, 1975), 230-232.
This teacher-developed audit simulation takes the student away from the textbook into the real work situation.

Hsiao, J.C. "The Learning Effectiveness of Microeconomic Simulation." *Education*, 95 (Spring, 1975), 270-275.
A study comparing an experimental class using simulation with a control class in which simulation was not used is discussed.

Kahl, James. *Computer-Based Simulation Models for Community College Business Students*. Paper presented at the Association for Educational Data Systems Annual Convention, New Orleans, Louisiana, April 16-19, 1973. 6pp. ED 087 426.
Instructors at Lower Columbia College in Longview, Washington use computer-based simulation models in lower level business administration courses. Almost 90 percent of the students favor the use of the simulation, and experience has shown that it provides for a realistic application of theory and principles, teaches students the value of intragroup process and communication in competitive decision-making environments, and documents the relevance of subject matter in related fields.

Koeninger, Jimmy G. *The Merchandising Game*. Columbus: Ohio State University, Ohio Distributive Education Materials Laboratory, n.d. 30pp. Available from Ohio Distributive Education Materials Laboratory, The Ohio State University, 1885 Neil Avenue, 115 Townshend Hall, Columbus, Ohio 43210. ED 112 236.
This decision-making game is built on a model that adheres to the economic principles of supply and demand. Game participants are faced with the task of generating profit in a simulated competitive situation. The game provides the opportunity for participants to gain a greater understanding of: (1) the relationship between income and costs and resulting profit; (2) the complexity of the buying process; and (3) the income statement.

Lewis, Darrell R., and others. *Educational Games and Simulations in Economics*. New York: Joint Council on Economic Education, 1974. 137pp. Available from Joint Council on Economic Education, 1212 Avenue of the Americas, New York, New York 10036 ($4.00). ED 095 057 (microfiche only).
This publication was prepared to: (1) update and expand elementary, secondary, and college teachers' knowledge of materials on non-computer-based games and simulations relating to the teaching of economics and corresponding social studies topics; (2) assist economic educators in developing criteria for evaluating the educational usefulness of exercises; (3) provide guidelines for game creation with existing resources; and (4) provide suggestions on how games and simulations can best be used in the classroom.

POLITICAL SCIENCE AND LAW

Baugher, Shirley Lewis. "Substance and Procedure: A Simulation Strategy." *Law in American Society*, 4 (February, 1975), 33-38.
The purpose of this simulation is to develop in students an awareness of one of the fundamental legal principles--that procedure is the essence of justice.

Bloom, Lawrence A., and others. *An Evaluation of PRINCE Materials for Teaching General Political Strategy Skills.* Paper presented at the Annual Meeting of the American Educational Research Association, Washington, D.C., March 30-April 3, 1975. 30pp. ED 106 197.
The PRINCE materials for undergraduate students developed at Syracuse University were field tested at six higher education institutions for this evaluative study. The materials, consisting of four versions of a simulation, were designed to teach skills for analyzing political situations from a strategic point of view, with the objective of improving political skills. Results indicate that students using the PRINCE materials tend to: (1) be more likely to define a clear-cut political issue; (2) write fewer words in defining the issue; and (3) make more specific suggestions about how to deal with more actors in trying to solve a political problem.

Davison, Susan E., ed. *Gaming: An Annotated Catalogue of Law-related Games and Simulations. Working Notes, No. 9.* Chicago, Illinois: American Bar Association, Special Committee on Youth Education for Citizenship, 1975. 39pp. Available from Special Committee on Youth Education for Citizenship, American Bar Association, 1155 East 60th Street, Chicago, Illinois 60637 (single copies free). ED 114 307.
Over 125 simulations and other games related to law are listed in this catalog. Sections cover: Basic Concepts of Law, The Constitution, The Bill of Rights, Current Issues, The Political Process, and Teacher Resources. Each entry includes recommended grade levels, author, title, distributor, release date, price, number of players and amount of time needed to play, and a brief annotation.

Deiner, John T. "Simulation Design as a Teaching Technique." *Teaching Political Science*, 2 (July, 1975), 433-436.
Students in a Latin American politics course at the University of Delaware designed and participated in a simulation of the political system of Argentina.

Goodman, F.L. *Gaming and "Functional Democracy."* Paper presented at the Annual Meeting of the American Educational Research Association, Washington, D.C., March 30-April 3, 1975. 16pp. ED 104 374.
An example of the way gaming can be used to bring attention to and improve skills in making democracy function better is presented. The game involves making choices among least, intermediate, and most preferred alternatives, keeping the preferences of the majority in balance with the preferences of the minority. It is designed to provide experience with new ideas about democracy.

Heighberger, Neil. *Simulation: The Motivation Connection.* Paper presented at the Annual Meeting of the American Political Science Association, San Francisco, California, September 2-5, 1975. 12pp. ED 110 401.

After a brief introduction to the educational benefits of simulation/games, the use of two games in undergraduate political science courses is described. "Simulated Society" (SIMSOC) is used in a beginning level American government course to examine questions related to nation-building. In an advanced course on the legislative process, the simulation "Decision Making by Congressional Committees" is used to examine factors in a bargaining situation. The most important learning occurs in the debriefing phases of the games.

Jackson, Robert M., and others. *Simulated International Politics: Classroom Exercises.* Syracuse, New York: International Studies Association; St. Louis: University of Missouri, Center for International Studies, 1973. 76pp. Available from Center for International Studies, University of Missouri, St. Louis, Missouri 63121 ($1.50).

This manual consists of six easy-to-use simulation exercises for foreign relations classes at the secondary level. The games are designed to teach decision-making skills, to sensitize students to the manner in which Americans have come to view the world, to help students understand the need to manage problems before they become too severe, and to demonstrate the impact of coalitions on the political stability and development strategies of developing nations. All materials necessary for playing each game are included in the manual.

Jitkoff, Julia Armstrong, and Edward Doty. *Decision Makers, a Simulation Game about Community Change.* New York: American Friends Service Committee, Metropolitan Regional Office, and United Nations Association of the United States of America, 1972. 63pp. Available from American Friends Service Committee, Metropolitan Region, 15 Rutherford Place, New York, New York 10003 ($5.50). ED 088 751.

"Decision Makers" is designed to simulate the problems faced by groups trying to produce peaceful social change in their communities. This version illustrates the problems faced when a community group attempts to introduce a course on the issues of war and peace in the local high school. An introduction, checklist, and scripts for moderators are provided, along with charts noting progress in the change process. A list of resource organizations, ways to adapt the game for other social change issues, sample questions, and a game fact sheet are included.

Katsch, Ethan, and others. "Classroom Strategies--Guilt by Negotiation: A Simulation of Justice." *Law in American Society*, 3 (May, 1974), 23-28.

A game based on a simulated plea bargaining leads to understanding of negotiation, compromise, and decision-making skills, as well as providing information about the criminal justice process.

King, Donald B. "Simulated Game Playing in Law School; An Experiment." *Journal of Legal Education*, 26 (No.4, 1974), 580-594.

Six simulated games, three with a legislative setting and three with a court setting, were successfully used in a commercial law class. The author discusses teacher and student evaluations of their effectiveness.

Knapp, Lonnie, and others. "Insula-Contrata: A Simulation Game." *Geographical Perspectives*, 34 (Fall, 1974), 32-35.
In the simulation/game "Insula-Contrata," students create an uninhabited island and, through small group process, make decisions about government, economics, justice, and land use on the island.

Martz, Carlton S. "Moot Court--Parducci v. Rutland." *Social Education*, 39 (April, 1975), 212-213.
A simulation/game examining the issue of academic freedom through a mock trial of the Parducci v. Rutland case is presented in this article.

Miller, Michael J., and Charles W. Thomas. "The Bureaucratization Process and Its Effects: A Simulation." *Teaching Sociology*, 2 (October, 1974), 43-56.
This article describes a simulation that aids college students to better understand a process of bureaucratic growth and the effects of this structure on alienation from work and expressive relationships. A brief discussion on the general nature of gaming and simulation techniques is included.

Nesbitt, William A., and Andrea B. Karls. "Control of the Seas." *Intercom*, June, 1975, pp. 26-30.
Background information and a role-playing activity that examines the conflict over control of the oceans are provided.

Rabin, Jack, and Donald B. Dodd. *The "ERA" Comes to New Columbia. A Simulation.* 1973. 14pp. ED 099 301.
This game is designed to introduce secondary and college students to the legislative process and the issues surrounding the Equal Rights Amendment (ERA) through simulation and role-playing.

Taylor, Leigh H., and Stephen Kaminshine. "Classroom Strategies: The Voting Game." *Law in American Society*, 4 (September, 1975), 27-31.
This article discusses a classroom simulation of the voting process. Included are the game objectives, instructions, and follow-up activities.

VOCATIONAL EDUCATION

Handbook for North Dakota Vocational Office Education Teacher-Coordinators. North Dakota Occupational Models. A Career Cluster Concept. Grand Forks: University of North Dakota, Department of Business and Vocational Education, 1973. 96pp. ED 109 331.
North Dakota Occupational Models have been developed from the practices of actual offices and businesses in the state, duplicating real jobs and work materials and complete with pressure and decision-making activities, to provide realistic work experiences for secondary students who have completed the basic skills courses in office education. A variety of suggestions for orientation, career exploration, and implementation of the occupational model plan are presented in the teacher's handbook.

Kleinberg, Jeffrey L. "Exploring Work (Dis)Satisfaction: A Simulation for the Classroom." *Vocational Guidance Quarterly*, 24 (September, 1975), 79-80.
The purpose of this article is to describe a simulation activity that has been effective in teaching community college students about work satisfaction. A simulated factory instigates job dissatisfaction which is then discussed in terms of cause and effect. The work is redesigned to enhance job satisfaction and productive efficiency.

Koeninger, Jimmy G. *Simulations and Games. A Guidebook for Distributive Education.* Columbus: Ohio State University, Ohio Distributive Education Materials Laboratory, n.d. 83pp. ED 112 220.
This guidebook for the teacher/coordinator of distributive education presents abstracts of 57 games and simulations. Each abstract provides a brief overview of the game or simulation, as well as author, publisher, cost, copyright date, time required, and number of players. Directories of publishers, newsletters, professional organizations, and centers for simulation development also are included.

Rowe, John L. *The Development of Teaching Units for Office Education Simulated Programs for Use in the State of North Dakota. Final Report.* Grand Forks: University of North Dakota, Department of Business and Vocational Education, June 1973. 61pp. ED 109 332.
This document describes the development of a library of 24 North Dakota Occupational Models, each patterned after a specific job in a specific office. A teacher's manual giving tips on implementing the program also was developed. The models were designed to provide high school students with a realistic introduction to a variety of office jobs and were based on the work experiences of employees in North Dakota offices. The project found that the models can be used in vocational office education programs of any size, can supplement or substitute for cooperative work experience, are useful for the student of less than average ability, and can be used regardless of available facilities and equipment.

SCIENCE AND MATHEMATICS

Cabrol, D., and others. "Laboratory-Equivalent Minicomputer Experiments: A Kinetic Application." *Journal of Chemical Education*, 52 (April, 1975), 266-268.
Programs that have been developed to allow kinetic experiments to be simulated on a small computer are described in this article. Principles guiding the conception of the programs and an instance of their application to a complex reaction also are discussed.

Hoffman, Ruth I. "Mathematics: More Learning Games." *Instructor*, 84 (March, 1975), 57-58.
Games of analysis or logical thinking are important reinforcers of various mathematical topics with children, and here the author suggests some games that might be used.

Hulten, Burma H. *Games and Teams: An Effective Combination in the Classroom.* Baltimore, Maryland: Johns Hopkins University, Center for the Study of Social Organization of Schools, April 1974. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, Illinois, April 15-19, 1974. 20pp. ED 090 927.

Researchers investigated the relative contributions of team competition and peer group practice sessions in seventh grade math courses to the effectiveness of a classroom instructional technique known as Teams-Games-Tournament (TGT). It was concluded that games can be effective instructional devices for increasing academic achievement and that their success as instructional aids varies with the reward systems and practice structures under which students operate.

Jones, James Edward. *Computer-Simulated Experiments in High School Physics and Chemistry.* Doctoral dissertation. Iowa State University, Ames, Iowa, 1972. 131pp. Available from University Microfilms, 300 N. Zeeb Road, Ann Arbor, Michigan 48106 (No. 73-3897; microfiche $7.50, photocopy $15.00).

A study of the feasibility of using computer-simulated experiments in high school physics and chemistry courses found that: (1) the attitudes of the experimental (computer simulation) group and the control (traditional techniques) group toward the subject and toward laboratory work were not significantly different before or after the experiment; (2) at the start of the experiment, the experimental group's attitude toward the computer as a laboratory aid was not significantly different from the attitude of the control group; (3) at the close of the experiment, the experimental group's attitude toward the computer as a laboratory aid was significantly more positive than the attitude of the control group; and (4) the achievement test mean scores for the two groups were not significantly different.

Morris, R.M., and P.G. Dean. "The Use of Interactive Simulation in Biological Science Teaching." *International Journal of Mathematical Education in Science and Technology*, 5 (July-September, 1974), 389-394.

Oliver, P.T.P. "Population Genetics Simulated with Playing Cards." *Journal of Biological Education*, 9 (April, 1975), 83-85.

Playing cards are used to demonstrate several aspects of allelism and allele frequency in a gene pool. They provide an "unexpected" result, promote group discussion, and may stimulate students to devise variations for comparison.

Pitcairn, Cameron C., and Gregory L. Baker. "The Rocket Game." *Physics Teacher*, 12 (October, 1974), 427-429.

"The Rocket Game" simulates problems of rocket propulsion, hovering, and soft landing.

Reagan, Douglas P. "Simulating Biological Processes." *American Biology Teacher*, 36 (December, 1974), 554-556.

This article describes the application of simulation as a teaching tool to provide a means of understanding living organisms by representing only the essential aspects of selected biological processes that might not be readily visualized.

Stebbins, Robert C., and Brockenbrough Allen. "Simulating Evolution." *American Biology Teacher*, 37 (April, 1975), 206-211.
Described here are simulations that can be used to illustrate evolution by natural selection. Suggestions for simulating phenomena such as adaptive radiation, color match to background, and vision of predators are offered.

Thiagarajan, Sivasailam. "Calculators are 'In' and Cheap: Here are Four Games You Can Play Using the Least Expensive." *Simulation/Gaming/News*, 2 (January, 1975), 10-13.

MISCELLANEOUS

Alley, Robert. *Simulation as an Inservice Technique in the Integration Process.* 1974. 15pp. ED 109 106.
Since changes in teacher attitudes are likely to affect changes in student attitudes, inservice programs that assist teachers in changing their attitudes toward integration are important. This paper discusses certain hypotheses concerning the advantages of simulation in such inservice programs. Some available simulations dealing with integration are: (1) those developed at the University of Tennessee; (2) Cruickshank's Inner-City Simulation Laboratory; and (3) a simulation called "Confrontation," developed by the Far West Regional Education Laboratory.

Berg, Marlowe. "Conflict Encounters: Strategy for the Elementary Classroom." *California Council for the Social Studies Review*, 14 (Winter, 1974), 18-19.
An example of how to design and implement a gaming strategy to aid elementary students in dealing with future conflict situations is described.

Carroll, James L. "Demonstration Techniques Simulating Four Learning Disabilities." *Journal of Learning Disabilities*, 7 (May, 1974), 287-289.
To help adult students understand the learning disabled child's frustrations, four demonstration techniques simulating receptive difficulties in the areas of visual, auditory, and tactile discrimination, and in problem-solving have been developed.

Chapman, Thomas H. *Simulation Game Effects on Attitudes Regarding Racism and Sexism.* College Park: University of Maryland, Cultural Study Center, August 1974. 27pp. ED 106 392.
The research reported here examines the effectiveness of a social simulation game, "Starpower," and a discussion model in developing more positive attitudes towards blacks and women. Although "Starpower" has been used extensively throughout the country, almost no research has evaluated its effectiveness in terms of attitude and/or behavior change related to racism and/or sexism. Experimental subjects, particularly those who discussed both racism and sexism, indicated significantly more positive attitudes toward blacks and more willingness to support black student growth activities. Males who discussed either sexism only or both racism and sexism demonstrated significantly more positive attitudes toward women and men in nontraditional sex roles.

Claiborn, William L., and Raymond W. Lemberg. "A Simulated Mental Hospital as an Undergraduate Teaching Device." *Teaching of Psychology*, 1 (October, 1974), 38-40.

A simulated mental hospital, which ran for 56 hours over a period of two consecutive weekends, is described as an effective teaching device for an undergraduate course in clinical psychology.

Devries, David L., and Keith J. Edwards. "Student Teams and Learning Games: Their Effects on Cross-Race and Cross-Sex Interaction." *Journal of Educational Psychology*, 66 (October, 1974), 741-749.

The results of this study indicate that administering team rewards to heterogeneous groups of students helps reduce race and sex barriers inhibiting student interaction. The team effect on reducing cross-racial barriers was particularly potent for the helping relationship.

Fincher, Cameron. *Simulation Techniques in Training College Administrators.* Athens: University of Georgia, Institute of Higher Education, 1973. 38pp. Available from Institute of Higher Education, University of Georgia, Athens, Georgia 30602 ($2.00). ED 098 839.

Traditional methods of recruitment and selection in academic administration have not placed an emphasis on formal training or preparation but have relied heavily on informal notions of experiential learning. Simulation as a device for representing complex processes in a manageable form, gaming as an organizing technique for training and indoctrination, and modeling as an analytical tool for concepts and principles can serve an unusually valuable purpose by reducing conflict with traditional notions. Not only can simulation reduce the initial reluctance of administrators to seeking formal training, but it also has the potential to present concepts, principles, and techniques in an organized, integrative manner that could make their application a more likely prospect.

Goldman, Richard M. "Simulation Design for a Graduate Course in Education, or 'Mr. Phillips' Comes to the University." *Educational Technology*, 15 (July, 1975), 26-28.

By using a simulation, students in an early childhood education course were able to become expert with difficult material and to apply their expertise. The author concludes that simulation can be effectively applied to learning environments stressing the acquisition of skills and content.

Golick, Margie. *Deal Me In! The Use of Playing Cards in Learning and Teaching.* 1973. 100pp. Available from Jeffrey Norton Publishers, Inc., 145 East 49th Street, New York, New York 10017 ($5.95).

This book presents a collection of card games that can be used as learning tools in early childhood classrooms, and that should prove especially helpful to the teacher of exceptional children.

Hoetker, James. *Theater Games: One Way into Drama.* Urbana, Illinois: ERIC Clearinghouse on Reading and Communication Skills, and National Council of Teachers of English, April 1975. 31pp. Available from National Council of Teachers of English, 1111 Kenyon Road, Urbana, Illinois 61801 (No. 53623; non-member $1.50, member $1.40). ED 105 516.

Although drama should be a central, indispensable activity not only in language arts programs but in college and university programs preparing teachers of language arts and reading, few teachers have had opportunities

for the workshop and theater experiences that would enable them to introduce their students to the world of drama. This booklet suggests resources that are rich and detailed enough to enable any teacher to learn drama while teaching it. The primary focus is on Viola Spolin's "Improvisation for the Theater," which sets out a structured sequence of dramatic activities--theater games--designed to prepare students of any age to act on the stage.

Hummel, Thomas J., and others. "Client 1: A Computer Program Which Simulates Client Behavior in an Initial Interview." *Journal of Counseling Psychology*, 22 (March, 1975), 164-169.

This simulation project is valuable for training and evaluation in counselor education and in studying counselor cognitive processes. It also provides an opportunity to test the sufficiency of an explicit set of theoretical constructs for explaining client behavior.

Kovac, Roberta J., and Michael A. Pollack. *Simulation/Gaming in Teacher Education: An Annotated Bibliography of Selected Sources for Use in the Development of Teacher Training Programs.* Bloomington: Indiana University, Center for Invention and Development, n.d. 40pp. ED 112 836.

The Center for Innovation and Development has compiled an annotated bibliography that identifies sources and sets parameters for the use of games and simulation in the classroom. The introduction attempts to clarify the difference between simulation and gaming and the relative position of each in teacher education. A large percentage of the references are from *Resources in Education* (RIE) and *Current Index to Journals in Education* (CIJE).

Little, Timothy. "A Simulation to Launch a Study of Law and Consumerism." *Social Education*, 39 (March, 1975), 159-162.

A simulation, "Truth in Advertising," provides upper elementary students with a frame of reference to assess the advertising they encounter and to make them aware of the rules of fair practice in the marketplace.

Loomis, Richard F. "A S/G/N Special Survey: Conflict Gaming--Who's Doing What in 1975?" *Simulation/Gaming/News*, 2 (January, 1975), 18-19.

The author designates five general categories of "conflict games"--board games, miniatures, Diplomacy, clubs and conventions, and science fiction games. Each category includes several sources for further information.

McClain, Donald H., and others. *A Computer-Assisted Patient Simulation.* Iowa City: University of Iowa, Computer Center, August 1975. Paper presented at the Association for Development of Computer-Based Instructional Systems Summer Meeting, Portland, Maine, August 4-7, 1975. 10pp. ED 112 889.

A set of computer programs and data files have been designed to provide a simulated experience with patient diagnosis problems for medical students. The programs, called CAPS (Computer-Assisted Patient Simulation), aim to provide opportunities for making diagnoses and decisions, to develop problem-solving skills, to expand knowledge of specific diseases and hospital resources useful in differentiating between them, and to teach cost-effective utilization of a pathology laboratory. It was concluded that the system was a feasible approach to help students in gathering and analyzing pertinent information and arriving at a definite diagnosis and treatment plan.

McGuire, Christine. *Simulation Technique in the Teaching and Testing of Problem-Solving Skills.* Columbus, Ohio: ERIC Clearinghouse for Science, Mathematics, and Environmental Education, March 1973. 32pp. Available from ERIC Clearinghouse for Science, Mathematics, and Environmental Education, Ohio State University, 1200 Chambers Road, Third Floor, Columbus, Ohio 43212 (No. 118S; $1.00). ED 091 152.

Simulation techniques used in the medical education program at the University of Illinois are described in this paper presented at the Annual Meeting of the National Association for Research in Science Teaching. Medical students interact with simulated patients and acquire problem-solving competencies. Evidence suggests that when simulation techniques are properly exploited, they hold considerable promise for being powerful tools not only for instruction, but also for research into the nature of problem-solving.

Spencer, Judson, and John P. Gobetti. *Computer Aided Instruction and Problem Solving in the Teaching of Oral Diagnosis.* Ann Arbor: University of Michigan, School of Dentistry, April 1974. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, Illinois, April 15-19, 1974. 10pp. ED 089 677.

A computer-assisted instructional (CAI) program is being used at the University of Michigan School of Dentistry to aid in the teaching of oral diagnosis to dental students. The program is designed to simulate a real life situation--the diagnosis of patient illness--that would not be otherwise available to the student, and to demonstrate to the dental student the need for correlating a thorough case history with a clinical examination and laboratory tests. Field test results show that students prefer the CAI mode and that the program meets student needs and saves them time.

Zachert, Martha Jane K. *Simulation Teaching of Library Administration.* 1975. 297pp. Available from R. R. Bowker Company, 1180 Avenue of the Americas, New York, New York 10036 ($18.95).

The library science teacher can use case studies, simulations, and role-playing to acquaint future librarians with the realities of library management. By using models, contextual statements, incident materials, and course management materials, the students can be involved in specific library problems that will later have broad on-the-job application. In order to most effectively use this method, instructors must change from the traditional teacher-centered model to a facilitator model where they initiate and evaluate exercises, but are no longer the focus of class attention.

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